REMARKS

Reconsideration of the present application, as amended, is respectfully requested. Applicants express their appreciation for the courtesy of the telephone interviews with the Examiner, conducted on June 1, 2009[1] and June 8, 2009[2], respectively. The Examiner confirmed (June 8th) that the first Amendment and Response dated May 8, 2009 will be entered, and that the further amendments to the claims will be based on the May 8th claims. During the June 1st interview, it was agreed that the specification will be amended to note the address of the "Korean Culture Center of Microorganisms." The phrase, "a base sequence represented by," will be deleted as unnecessary from claims 7, 9, 11, 13, 22, 24, 26, 28 and 33. The phrase, "protective" will be deleted from claim 30. The terms relating to, "vaccine" will be deleted from claims 35 and 38-40 and amended in conformity with the claims previously amended. Thus, as for the other claims, "DNA vaccine" is replaced by "plasmid mixture" and "adenovirus vaccine" is replaced by "adenovirus mixture."

The Examiner also requested that the term, "priming frequency" be clarified, if possible. It is submitted that this last point is clearly addressed by considering the definition provided at page 14, lines 7-10 of the specification.

It is Applicants' understanding that the previously withdrawn method claims (claim 30, *et seq.*) will be examined once the pending composition claims are determined to be in condition for allowance.

A. AMENDMENTS TO THE SPECIFICATION

The specification has been amended to include the address of the Korean Culture Center of Microorganisms, in several places in the specification, as required by the Examiner. This information was published in the parent international patent application. In addition, at pages 62-63, the construction of vector pTV2-mp35/IRES/mp40-N220L is described, with the vector having Accession No: KCTC 0745BP. The KCTC address is also now inserted by amendment into page 63, based on the Examiner's requirements.

It is submitted that these amendments do not represent new matter.

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[1] With Applicants' undersigned representative.

[2] With Applicants' representative Yun H. Choe, Ph.D.

B. REJECTION UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

The claims were amended as discussed above, without prejudice to future prosecution of the subject matter of the claims before amendment. In addition, claim 31 is amended to recite that, "the priming frequency of the plasmid mixture is 2-5" in order to correct an informality in that numerical range. The priming frequency of 2-5 is supported by the specification at page 25, lines 6-10.

C. REJECTION UNDER 35 U.S.C. § 103(a)

The Examiner has made a new rejection of claims 1, 2, 5, 6, 16, 17, 20, 21, 38 and 39 under 35 U.S.C. § 103(a) as allegedly unpatentable over Saito et al. ("Saito;" US Patent 5,731,172), or in the alternative, over Tang et al. ("Tang;" US 200410166488 Al), either taken in view of Lee et al. ("Lee;" Virology, 2001, Vol. 279, p. 271-279). The Examiner takes the position that Tang or Saito teach plasmids with HCV genes in an analogous size ranges to that which is claimed. The Examiner concedes that neither reference teaches 35-40 amino acids eliminated from the N-terminal region of the core protein, but then alleges that Lee remedies this deficiency.

The Examiner states that,

> Lee teaches that the HCV core protein has immunosuppressive properties and suppresses the induction of the cytotoxic T cell response through inhibition of IFN-gamma, IL-2, IL-12 and NO production (see Results on pages 272-275 and Figure 2) [and] that regardless of the expression level of the HCV core protein, either the expression level was high, medium or low, as long as the HCV core was truncated, the HCV core expressing cells suppressed the production of IL-12 and NO as compared to no IL-12 or NO inhibition by cells that did not express the HCV core (see Figure 2).

The Examiner then takes the position that, "[i]t would have been *prima facie* obvious to provide Saito's or Tang's composition comprising HCV genome comprising El, E2, NS3, NS4, and NS5 genes of HCV and to eliminate the 35-40 amino acids of the N-terminal region of the HCV core protein."

Applicants respectfully disagree. In order to sustain a rejection as *prima facie* obvious, the facts must show that the elements of the rejected claim(s) are present or suggested, *e.g.*, by one or more references. The claimed invention must be viewed as a whole. *See* generally MPEP

§§ 2141 and 2142. Here, it is urged that the primary reference(s), taken in any combination with the secondary reference, would have failed to teach or suggest the invention of claim 1, *et seq.* to the ordinary artisan.

Turning first to the Tang reference. Tang was published on August 26, 2004, and filed on February 5, 2004. Tang claims priority from PCT/CN02/00536, which published as WO03040356A1 in the Chinese language. Since Tang claims priority from an international patent application not published in the English language, and from a foreign national phase application, the Patent Office is only entitled to apply Tang as a 35 USC § 102(e)/103 reference with a reference date as of its U.S. filing date. The present application is entitled to priority of November 6, 2002 and September 27, 2002. The enclosed English language translations of the respective South Korean priority documents are submitted to support the pending claims, and therefore to perfect the respective foreign priority dates.

For the convenience of the Examiner, the following table is provided, which summarizes the support provided by the respective priority documents. The citations are merely examples, and there may be other points of support, either express or inherent.

Pending Claims	**Support in10-2002-58712**	**Support in 10-2002-68496**
1-2	Page 17, lines 16-26 Page 18, lines 1-11	Page 11, lines 9-20
5	Page 22, lines 24-25	Page 16, lines 8-9
6	Page 23, lines 1-12	Paragraph bridging pages 16-17
7-8	Paragraph bridging pages 50-51	Page 35, second paragraph
9-10	Page 51, lines 12-23	Paragraph bridging pages 35-36
11-12	Page 52, first paragraph	Page 36, first full paragraph
13-15	Page 17, lines 9-15	Page 11, last full paragraph; Paragraph bridging pages 11-12
16-17	Page 17, line 16 – Page 18, line 11	Page 12, line 10, through page 13, line 11
20	Claim 16	Claim 20
21	Claim 17	Claim 21
22-23	Page 63, lines 2-13, et seq.	Claims 22-23
24-25	Page 64, lines 13-21	Claims 24-25
26-27	Paragraph bridging pages 64-65	Claims 26-27
28-29	Claim 18	Claims 28-29
30-32	Claim 22; text bridging pages 29-30; claim 24	Claim 30; first full sentence of page 21; claim 32
33-34	Claims 25 and 26	Claim 33 and 34
35	Claim 27	Claim 35
38-40	See Example 11 on pages 90-91	Paragraph bridging pages 23-24 and Example 6, page 50, et seq.

Therefore, it is urged that Tang is removed as both a published reference, and as a reference under 35 USC §103, based on 35 USC §102(e)/103. *See*, MPEP 706.02(f) for a discussion of this topic. If the Examiner disagrees, or intended that Tang be cited as a reference under a different theory, Applicants reserve the right to respond to such a rejection, as necessary.

Turning now to the remaining references. The Examiner indicated that Saito disclosed a recombinant adenovirus vaccine containing HCV gene expressing plasmid (example 2). In addition, the Examiner indicated that the whole HCV genome includes any HCV gene containing E1, E2, NS3, HS4 and NS5, even though it was not specifically mentioned which gene would be expressed.

The Examiner's attention is respectfully directed to Comparative Example 2 (column 18, lines 36-43) in Saito. This example discloses a cDNA fragment of HCV, having a sequence of nucleotide numbers 307-2554, which corresponds to core, E1 and E2 or HCV. Therefore, contrary to the Examiner's position,

(i) the recombinant adenoviral vaccine taught by Saito does not contain all of the HCV genes which include E1, E2, NS3, NS4, and NS5. (*See* the Office Action, at page 4, lines 1-2) In other words, the recombinant adenovirus in Saito contains only core, E1, and E2, and does not contain NS3, NS4, and NS5 which comprise the 2nd and 3rd plasmids, respectively, as required by claim 1 of the present invention, and Saito deletes E1, in whole or in part (Col. 4, lines 36-40; Col. 5, lines 59-61);

(ii) thus, two of three plasmid comprising the present invention are not taught by Saito et al.;

(iii) Furthermore, the core described by Saito does not require the elimination of a particular range of amino acids from the core N-terminal region.

Turning now to the Lee reference. The Examiner takes the position that Lee teaches that the HCV core (protein) has immunosuppressive properties and suppresses the induction of the cytotoxic T cell response through inhibition of IL-12, IL-2 and IFN-gamma. Moreover, the Examiner takes the position that Lee teaches that, regardless of the expression level of HCV core protein, as long as the HCV core was truncated, the HCV core expressing cells suppressed the production of IL-12 and NO compared to the control group.

The Examiner states that,

> Lee teaches that regardless of the expression level of the HCV core protein, either the expression level was high, medium or low, as long as the HCV core was truncated, the HCV core expressing cells suppressed the production of IL-12 and NO as compared to no 11-12 or NO inhibition by cells suppressed the production of IL-12 and NO as compared to no IL or NO inhibition by cells that did not express the HCV core (see Figure 2).

Applicants respectfully disagree with this characterization of the teachings of Lee. Applicants respectfully submit that Lee fails to disclose any experimental data measuring IL-12 or NO production levels with a different length or different region of truncated core protein. In fact, Fig. 2 of Lee presents the IL-12 and NO production level at various expression levels of the HCV core protein. These are: RAW 264.7/core(H) having high level expression of the HCV core protein, RAW 264.7/core(M) having medium level expression, RAW 264.7/core(L) having low level expression) compared to a control group (RAW 264.7/Nco) without any core protein.

Therefore, Lee does not provide any data where differently truncated HCV core protein was employed and compared for their inhibition level of IL-12 or NO production. *See* Fig. 2 and the paragraph bridging pages 272 and 273. Lee only teaches varying immunosuppressive function depending on the amount of core protein. In other words, Lee only teaches that HCV core protein has the immunosuppressive function.

The present invention provides a novel plasmid where 35-40 amino acids at the N-terminal of the core protein is deleted. This maintains the immunogenicity of the core protein while removing the immunosuppressive function. The present invention also provides additional novel expression vectors to be used in combination, as claimed.

In contrast, taking the disclosures of Saito and Lee together, Saito fails to teach using three different expression vectors comprising three different sets of hepatitis C genes and Lee fails to teach how to remove the immunosuppressive function of the hepatitis C core protein, while maintaining its immunogenicity. Therefore, it would not have been *prima facie* obvious over Saito, taken in any combination with Lee, to have made the invention as presently claimed, e.g., by removing 35-40 amino acids from the N-terminal of the core protein.

For all of these reasons, reconsideration and withdrawal of these grounds of rejection is respectfully requested.

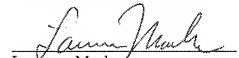
D. Conclusion

It is respectfully submitted that application is in condition for allowance, and reconsideration and allowance is hereby requested. A Petition for Extension of Time for One Month, along with the required large entity fee, is included with this response. Should any additional fees or extensions of time be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit account # 02-2275.

An early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

LUCAS & MERCANTI, LLP



Laurence Manber
Reg. No. 35,597

LUCAS & MERCANTI, LLP
475 Park Avenue South
New York, New York 10016
Phone: 212-661-8000
Fax: 212-661-8002